PERFORMANCE AUDIT INSPECTION

FACILITY: City of Rutland WWTF

DATE OF INSPECTION: May 27, 2015

CHIEF OPERATOR: Robert Protivanski Jr. **CERTIFICATION**: Grade 5DM #1345

OPERATOR(S): Rodney Monroe **CERTIFICATION(S)**: Grade 5DM #654

James Dorman	Grade 5DM #982
Mark Bresnick	Grade 5DM #968
Daren Alberico	Grade 5DM #725
Mike Ladago	Grade 5DM #640
Tyson Barlow	Grade 5DM #1540
Wayne Wickens	Grade 2DM #1639
Tom Mitowski	Grade 2DM #403
Dave Shortsleeve	Grade 1DM #1105
Tyler Harte	Grade 1DM #1693

TRAINING: Robert Protivansky, Rod Monroe, James Dorman and Tyson Barlow have completed the 42 hour wastewater laboratory course offered by the State. They all hold Grade I NEWEA Laboratory Analyst certification.

SAMPLING:

***LOCATIONS ADEQUATE**? Influent samples are collected from the influent channel just at the point where the two influent channels combine. Please refer to notes in the Comments section regarding relocation of the sample point.

Effluent samples are collected from the effluent channel post dechlorination, just over the weir.

***REPRESENTATIVE OF ACTUAL CONDITIONS**? Yes. Moving the influent

sample point downstream will improve the representative nature of the samples.

PROPERLY FLOW PROPORTIONED? Equal volumes of influent samples are collected via a Sigma 900 automatic sampler at the rate of one sample every 15 minutes. Samples are hand composited based on hourly flow readings.

Effluent samples are flow proportioned via the Sigma 9000 automatic sampler with connection to the effluent flow meter. 350 milliliter samples are collected every 50 pulses. A total of almost 20 liters is collected over a 24 hour period.

PROPER CONTAINERS? Yes.

PROPERLY PRESERVED? Yes.

PROPER HOLD TIMES OBSERVED? Yes.

pH, Total Residual Chlorine, Settleable Solids and Turbidity analyses are all performed within 15 minutes after the sample is collected.

The Total Suspended Solids and Biochemical Oxygen Demand analyses are performed within 8 hours after the last discrete sample is collected.

Escherichia Coli. samples are analyzed well within the required hold time.

PROPER DOCUMENTATION? Yes. Documentation is quite good.

EQUIPMENT:

ADEQUATE FOR ANALYSES PERFORMED? Yes.

pH - *An Oakton model 510 pH meter is used in conjunction with an Oakton gel filled combination pH probe with built in temperature probe for electrometric determination of pH. Please refer to notes in the "Comments" section below regarding suggestions for purchase of a separate temperature probe. A Hannah model 98140 meter is sometimes used for as a backup for pH analysis.

Total Residual Chlorine - A Hach model DR 890 spectrophotometer is used for colorimetric analysis of Total Residual Chlorine.

Total Suspended Solids – NCL brand 934-AH 7.0 centimeter filters are used in 7.0 centimeter ceramic funnels for sample filtration. The funnels are placed onto a copper manifold connected to a Fischer Scientific vacuum pump. Filters are dried in a Grieve brand drying oven and weighed on a Schimadzu AUX 120 analytical balance.

***Biochemical Oxygen Demand –** A YSI model 5100 meter with YSI 5010 Dissolved Oxygen (DO) probe with external stirrer is used to determine DO in the analysis of Biochemical Oxygen Demand. Samples are incubated in a VWR Scientific Model 2020 low temperature incubator. Please refer to notes in the "Comments" section regarding the method and reagent used in the BOD analysis.

***Escherichia Coli. –** The modified mTEC method is used for analysis of Escherichia Coli. Filters, media and plates are purchased from Aqua-Plates. Samples are filtered through 0.45 micron filters in sterile Nalgene Funnels supplied by Thermo Scientific. Samples are first incubated at 35° C in a VWR Scientific incubator. They are transferred to a Hach Model #26PC water bath at 44.5°. Please refer to notes in the "Comments" section regarding preparation of the positive control used in this analysis.

***MAINTENANCE AND CALIBRATION ADEQUATE**? Please refer to notes in the "Comments" section regarding pH standardization.

***DOCUMENTED**? Documentation is quite good. Please refer to notes in the "Comments" section regarding use of two pH meters.

ANALYSES:

PARAMETERS PERFORMED ON SITE: pH, Total Residual Chlorine, Settleable Solids, Total Suspended Solids, Biochemical Oxygen Demand, Turbidity and Escherichia Coli.

PARAMETERS PERFORMED OFF SITE: Total Phosphorus and Total Kjeldahl Nitrogen

NAME OF CONTRACT LABORATORY USED: Endyne

***QC MANUAL?** Please refer to notes in the "Comments" section regarding updating the quality control manual.

PARTICIPATION IN BLIND SAMPLE PROGRAM? Yes. Proficiency samples are obtained from Phenova Laboratories

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MAJOR EQUIPMENT OPERATIVE? Yes. All major equipment was operating well at the time this evaluation was performed.

VISUAL APPEARANCE OF EFFLUENT: Excellent

FLOW CHECK ADEQUATE? Yes**.** Physical measurement of head at the weir is compared to the SCADA system reading at exactly the time taken. The operator uses a cell phone to communicate the reading at the exact time it is taken. Excellent.

CONCERNS AND COMMENTS:

1. The influent sampling point should be moved to a point downstream of the present location. Samples should be collected at a point sufficiently downstream of the convergence of the two influent channels so as to ensure representation of the entire influent stream.

2. A Hannah model 98140 pH meter is sometimes used for backup when performing effluent pH analyses. Documentation of meter standardization must indicate which meter is being used in the standardization.

   Also regarding pH standardization, it is very important to clean and rinse thoroughly around the reference junction. The protective rubber sleeve may need to be removed in order to clean the junction properly.

3. Exact sampling and analysis times must be recorded for all NPDES permit required analyses. Specifically pH and Total Residual Chlorine analysis times must be recorded individually.

4. Regarding the analysis of Biochemical Oxygen Demand:

   The nutrient powder pillows used for dilution water preparation already contain the phosphate buffer solution. It is not necessary (OR ADVISED) to add additional phosphate buffer as this could significantly affect the results generated in this analysis

   The siphon tubing used in delivery of the sample to the BOD bottles should be replaced or at least thoroughly cleaned. Tubing should be cleaned (10% Sulfuric Acid wash followed by copious rinsing with distilled water) regularly to avoid contamination.

5. A minimum of 100 milliliters of sterile dilution water (plus wash down volume) MUST be used to prepare the “blank” used in the analysis of Escherichia Coli. Also regarding the 100 milliliter (100% sample concentration) sample, the funnel must be rinsed with a minimum of 25 milliliters of dilution water to ensure proper buffering and nutrient addition for ideal growth conditions. Finally, I would recommend using a “top lighted” magnifying lens as opposed to the binocular microscope presently used which has bottom lighting. The diffused light shining up through the plate can cause difficulty in identifying positive colonies.

6. The Laboratory Quality Control manual must be updated to reflect methods and equipment presently used at the Rutland facility.

RECOMMEND FOLLOW UP INSPECTION? No. I am extremely confident that Mr. Munroe will implement the required corrective actions in a timely manner. I am very impressed with Mr. Munroe's honesty integrity and willingness to improve.

OVERALL RATING: 2 (based on a rating system of 1-3)

INSPECTED BY: Andrew Fish

Wastewater Laboratory Spec.